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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/106,994	06/29/1998	TONIA G. MORRIS	INTL-0061(P5	7440

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EXAMINER

WHIPKEY, JASON T

ART UNIT

PAPER NUMBER

2612

10

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/106,994

Applicant(s)

MORRIS ET AL.

Examiner

Jason T. Whipkey

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 1998 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed September 3, 2002, have been fully considered but they are not persuasive.

2. The remarks in the amendment state that the rejection of claim 1 under 35 U.S.C. 102(a) should be withdrawn because "Bohm neither teaches nor suggests that for any one of [the] integrating device[s] shown in Figure 1], its associated pixel sensor includes more than one storage device" (page 3, lines 25-27). However, as the examiner stated in the Office Action mailed July 26, 2002, "The components are stored in storage units 21, 22, and 23, respectively (abstract, lines 15-16)" (page 4, lines 1-2).

Additionally, Bohm teaches that "*each image point unit comprises* an integrating device (7, 8; 11, 12; 15, 16) and *at least two storage units* (21, 22, 23)" (abstract, lines 14-16; emphasis added).

These reasons for rejection of claim 1 can also be applied to the applicant's arguments for the withdrawal of the rejection of claim 6. Additionally, the applicant argues that "Bohm neither teaches nor suggests its integration devices include more than one storage location such that *these storage locations are coupled to the same pixel sensor during different integration intervals*" (page 4, lines 6-8; emphasis added).

The examiner stated in the Office Action mailed July 26, 2002:

"The components are stored in storage units 21, 22, and 23, respectively (abstract, lines 15-16). When bi-directional photodiode 01 stores a red

integration signal, for example, switch 07 closes so the signal may be stored in integrating device 8 (abstract, lines 14-20). This process is repeated for the green and blue signals, which are stored in capacitors 12 and 16, respectively. It is inherent that only one of switches 07, 11, and 15 are open one at a time; otherwise, the output signals would not be discernable as red, green, and blue" (page 4, lines 1-8).

Using this reasoning, the invention disclosed by Bohm couples the pixel sensor (i.e., bi-directional photodiode 01) to the storage locations during different integration intervals.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 4, 18, 19, and 21 are rejected under 35 U.S.C. 102(a) as being anticipated by Bohm.

Regarding claims 1, 18, and 19, Bohm teaches of a color image sensor. Individual pixels are placed in an arrangement (abstract, line 2). As shown in Figure 1, bi-directional photodiode 01 — which acts as a pixel sensor — captures red, green, and blue color components of an image. The components are stored in storage units 21, 22, and 23, respectively (abstract, lines 15-16). When bi-directional photodiode 01 produces a red integration signal, for example, switch 07 closes so the signal may be stored in integrating device 8 (abstract, lines 14-20). This process is repeated for the

green and blue signals, which are stored in capacitors 12 and 16, respectively. It is inherent that only one of switches 07, 11, and 15 are open one at a time; otherwise, the output signals would not be discernable as red, green, and blue.

Regarding claim 4, since the integration signals are accumulated in capacitors 08, 12, and 16, it is inherent that the signals are analog signals.

Regarding claim 21, Bohn teaches "an optical sensor characterized by an image point unit arrangement, each unit of which includes ..." (abstract, lines 1-3). This indicates that multiple pixels are present on the optical sensor.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 3, 5, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm in view of Yanai.

Regarding all three claims, Bohm teaches of a color image sensor as described in the above rejection of claims 1 and 18. However, Bohm is silent with regard to including an A/D converter in the circuitry of each pixel sensor.

Yanai discloses an image pickup device, with pixels shown in Figure 34. Each pixel includes an A/D converter 11, which allows a digital signal to be stored in the pixel's shift register 12. As stated in column 29, lines 32-37, this reduces the amount of analog information transfer, resulting in an image of higher quality. Therefore, it would have been obvious to one skilled in the art at the time of the invention to perform A/D conversion within each pixel and store the result, as described by Yanai, in Bohm's image sensor.

8. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm in view of Elabd.

Regarding claim 6, Bohm teaches of a color image sensor as described in the above rejection of claim 1. However, Bohm is silent with regard to including a controllable color filter to cause the pixel sensors to indicate the color components one at a time.

Elabd discloses an image sensor with an array 480 of photosensitive elements 484. The entire resolution of the imager may be used to capture red, green, and blue images (column 4, lines 57-59). Storage location 490 may be used to individually store

the RGB images captured by elements 484. Filters 462 in wheel 460 are used in front of the image sensor (column 2, lines 45-49). Interface device 92 controls the filter wheel 82 (column 9, lines 11-13). The advantage to using a color filter wheel is that it allows each pixel sensor to be used as a red, green, and blue sensor, which allows for increased resolution and/or decreased cost. For this reason, it would be obvious for one skilled in the art at the time of the invention to use Elabd's color filter wheel with Bohm's sensors.

Regarding claim 9, since the integration signals are accumulated in capacitors 08, 12, and 16, it is inherent that the signals are analog signals.

9. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm in view of Elabd and further in view of Yanai.

Both claims may be treated as described in the above rejection of claim 6.

Regarding both claims, Bohm and Elabd are silent with regard to using an analog-to-digital converter with the pixels.

Yanai discloses an image pickup device, with pixels shown in Figure 34. Each pixel includes an A/D converter 11, which allows a digital signal to be stored in the pixel's shift register 12. As stated in column 29, lines 32-37, this reduces the amount of analog information transfer, resulting in an image of higher quality. Therefore, it would have been obvious to one skilled in the art at the time of the invention to have Bohm's image sensor perform A/D conversion within each pixel and store these digital signals, as described by Yanai.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason T. Whipkey, whose telephone number is (703) 305-1819. The examiner can normally be reached Monday through Friday from 8 A.M. to 5:30 P.M. eastern daylight time, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R. Garber, can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned are (703) 872-9314 for both regular communication and After Final communication.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office, whose telephone number is (703) 306-0377.

Any response to this action should be mailed to:

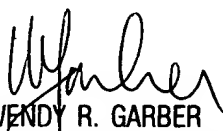
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or faxed to (703) 872-9314 for either formal or informal communications intended for entry. (For informal or draft communications, please label "**PROPOSED**" or "**DRAFT**".)

Hand-delivered responses should be brought to the sixth floor receptionist of Crystal Park II, 2121 Crystal Drive in Arlington, Virginia.

JTW

JTW
November 4, 2002


WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600